

Date: April 23, 2012

Subject: Inventory of Hospital/Medical/Infectious Waste Incinerators Potentially Covered by the Proposed Section 111(d)/129 Federal Plan  
EPA Contract No. EP-D-07-019; Work Assignment No. 4-13

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I. Introduction

Under sections 111 and 129 of the Clean Air Act (CAA), U.S. Environmental Protection Agency (EPA) is required to develop emissions guidelines (EG) for existing hospital/medical/infectious waste incinerators (HMIWI) and new source performance standards (NSPS) for new HMIWI. The regulations are designed to limit emissions of nine pollutants and opacity from these HMIWI. The nine pollutants are hydrogen chloride (HCl), carbon monoxide (CO), lead (Pb), cadmium (Cd), mercury (Hg), particulate matter (PM), dioxins/furans (CDD/CDF), nitrogen oxides (NO<sub>x</sub>), and sulfur dioxide (SO<sub>2</sub>). Regulations for the HMIWI category were promulgated on September 15, 1997. The EG are codified in 40 CFR part 60, subpart Ce, and the NSPS are codified in 40 CFR part 60, subpart Ec. The HMIWI regulations were remanded by the U.S. Court of Appeals for the D.C. Circuit (the Court) on March 2, 1999 for further explanation by EPA regarding the approach and methodology that EPA used to develop the HMIWI regulations. On October 6, 2009, the EPA promulgated amended EG and NSPS for HMIWI to address the concerns raised in the Court's remand.

Unlike the subpart Ec NSPS, which apply directly to new sources, states must develop a State Plan in order to compel existing sources to meet the subpart Ce EG. Together, subpart B and subpart Ce of part 60 specify the State Plan content and the general rules for adopting and submitting these State Plans. State Plans were developed previously to implement the EG adopted on September 15, 1997. Revised or new State Plans to implement the amended EG adopted on October 6, 2009 were due to EPA for review and approval on October 6, 2010. The EG require EPA to develop and implement a Federal Plan for each state that does not have an approved revised or new State Plan in place within 2 years after promulgation of the EG. A Federal Plan to implement the September 15, 1997 EG was promulgated on August 15, 2000 and is codified in 40 CFR part 62, subpart HHH. Amendments to the Federal Plan are currently being developed to implement the October 6, 2009 amendments to the EG.

For approval, one of the requirements of a State Plan is a source inventory and an emissions inventory. Likewise, the Federal Plan must contain a source and emissions inventory for HMIWI not covered under a State Plan. The purpose of this memorandum is to present an updated source and emissions inventory of the HMIWI industry for the proposed amendments to the Federal Plan and to document the sources of the database information. The database fields are listed in Table 1 below, along with descriptions of their respective information sources. The database is presented in Appendix A. The acronyms and abbreviations used in the database are presented in Appendix B.

## II. Updates to 2010 Inventory

For the October 6, 2009 amendments to the EG, EPA estimated there were 57 HMIWI currently operating in the U.S.<sup>1</sup> Based on recently obtained inventory information, EPA has determined that three of those HMIWI have shut down and now estimates there are 54 HMIWI currently operating.<sup>2-4</sup> The inventory of HMIWI was developed and updated as a result of contacts with EPA Regions, States, and HMIWI facilities and review of existing HMIWI inventories, title V permits, emissions test reports, and facility websites.<sup>1-5</sup>

## III. References

1. Memorandum from Thomas Holloway, RTI, to Project File. July 6, 2009. *Updated Hospital/Medical/Infectious Waste Incinerator (HMIWI) Inventory Database.*
2. Letter from James Bukowski, Johns Hopkins Institutions, to EPA Region III. January 28, 2010.
3. Zentner, Sonny. May 5, 2008. Analysis, Preliminary Determination and Draft Permit for the Renewal of Operation Permit Number 7720545800-P10 for St. Joseph's Hospital. Wisconsin Department of Natural Resources.
4. Letter from Wilkes-Barre General Hospital to EPA Region III. June 7, 2009.
5. Memorandum from Thomas Holloway, RTI, to Mary Johnson, EPA. July 6, 2009. *Revised Baseline Emissions and Emissions Reductions for Existing and New HMIWI.*

**Table 1. Fields Included in HMIWI Source and Emissions Inventory**

<b>Field name</b>	<b>Description</b>	<b>Information sources</b>
No	Unique number assigned by RTI to each record.	Assigned by RTI for each record. Records sorted by EPA Region, State, city, facility name, unit number, and pollutant.
Fac ID	Unique ID number assigned by RTI to identify a facility.	Assigned by RTI for each facility. Facilities sorted by EPA Region, State, city, and facility name.
Unit ID	Unique ID number assigned by RTI to identify each unit at a facility.	Assigned by RTI for each unit at a facility. Units sorted by EPA Region, State, city, facility name, and unit number.
Facility Name	The name of the facility.	Based on latest facility name from permits, test reports, inventories, EPA's Envirofacts website, and facility websites.
Unit Number	The unit number of the incinerator, if the facility has more than one incinerator.	Based on unit numbers from permits, test reports, and inventories.
Previous Facility Name	The previous name of the facility.	Based on previous facility names from permits, test reports, inventories, EPA's Envirofacts website, and facility websites.
Location Address	Physical location of the front door/main entrance of the facility site.	Based on facility address information from permits, test reports, inventories, EPA's Envirofacts website, and facility websites. Included physical address and, if applicable, post office box.
City	The name of the city.	Based on city name from permits, test reports, inventories, and facility websites.
State	State abbreviation.	Based on State or territory name from permits, test reports, and inventories.
Zip Code	The U.S. Postal Service zip code.	Based on zip code from permits, test reports, inventories, and facility websites.
County	The name of the county.	Based on county name from permits, test reports, inventories, and facility websites.
EPA Region	The EPA Region where the State or territory is located.	Based on EPA Region assignments for States and territories from EPA website.
X Coordinate	Longitude measure in decimal degrees of the angular distance on a meridian east or west of the prime meridian. Negative (-) data point for N. America. Include (-) sign, e.g., -123.234561.	Most based on the most accurate longitude data available from NEI (based on horizontal accuracy measure). Data for some units not available from the NEI. Obtained data for these units from EPA's Envirofacts or from RTI's GIS group.

Field name	Description	Information sources
Y Coordinate	Latitude measure in decimal degrees of the angular distance on a meridian north or south of the equator. Positive (+) data point for N. America. Include (+) sign, e.g., +78.123456.	Most based on the most accurate latitude data available from NEI (based on horizontal accuracy measure). Data for some units not available from the NEI. Obtained data for these units from EPA's Envirofacts or from RTI's GIS group.
UTM Zone	Zone number in UTM coordinate system.	Determined using an online program that converts latitude and longitude measures to UTM zone numbers.
Plan Status (1997 HMIWI Rule)	Status of State/Federal Plans implementing the 1997 HMIWI rule.	Taken from EPA's State/Federal plan status website for 1997 HMIWI rule.
Compliance Date (1997 HMIWI Rule)	Date of compliance with the State/Federal plans implementing the 1997 HMIWI rule.	Based on compliance dates in permits and inventories.
Facility Contact Name	The name of the facility contact.	Based on facility contact name from permits, test reports, inventories, facility websites, and facility contacts.
Facility Contact Phone	The phone number of the facility contact.	Based on facility contact phone numbers from permits, test reports, inventories, facility websites, and facility contacts.
SIC Primary	Standard Industrial Classification code.	Taken from NEI and SIC code table.
NAICS Primary	North American Industry Classification System code.	Taken from NEI and NAICS code table.
Site Description	Comments/description for this facility.	Based on SIC/NAICS code assigned to the facility.
Size Category	The size category of the incinerator (i.e., large (L), medium (M), small (S), or small rural (SR)).	Based on size information from permits, test reports, and inventories.
New Existing	Whether the incinerator is new (N) or existing (E).	Based on incinerator description from permits, test reports, and inventories.
Mode	The mode of operation of the incinerator (i.e., continuous (C), intermittent (I), or batch (B)).	Based on operating information from permits, test reports, and inventories.
Waste Heat Recovery Boiler	Whether the facility has a waste heat recovery boiler to recover as steam the energy from the HMIWI	Based on facility description from permits and test reports.

Field name	Description	Information sources
Commercial	Whether the facility is a commercial incineration facility (Yes/No).	Based on incinerator description from permits, test reports, and inventories.
Dun & Bradstreet Number	Dun & Bradstreet no. for the facility.	Based on information from Dun & Bradstreet Million Dollar Directory, NEI, and EPA's Envirofacts website.
Parent Company	The name of the parent company of the facility.	Based on information from permits, test reports, inventories, and facility websites.
Parent Company Employment	Number of employees in the parent company.	Based on information from Dun & Bradstreet Million Dollar Directory, Hoovers, Inc., and facility websites.
Parent Company Sales	Sales for the parent company (\$million).	Based on information from Dun & Bradstreet Million Dollar Directory, Hoovers, Inc., and facility websites.
Year of Sales/Emp. Data	The year for which sales and employment data were obtained for the parent company	Based on information from Dun & Bradstreet Million Dollar Directory and Hoovers, Inc.
Size Standards	SBA size standards for the parent company (i.e., sales in \$million, or number of employees).	Based on SBA Table of Small Business Size Standards Matched to NAICS Codes.
Small Business	Small business status based on SBA size standards (Yes/No/Borderline).	Determined based on comparison of SBA size standards to employment and sales information for parent companies.
Facility Registry Identifier	The ID number assigned by the EPA Facility Registry System.	Taken from NEI, permits, test reports, State correspondence, and EPA's Envirofacts website.
Other Facility Registry Identifiers	Other ID numbers assigned by the EPA Facility Registry System.	Taken from NEI, permits, test reports, State correspondence, and EPA's Envirofacts website.
Emission Unit ID	Unique ID reported consistently over time by State/local/tribal agency.	In most cases, based emission unit IDs on permits, test reports, inventories, State correspondence, and NEI. Otherwise, assigned an emission unit ID of "1."
Emission Unit Description	A text description of the Emission Unit.	Described emission units as "hospital/medical/infectious waste incinerators." Also included information about the model of incinerator, if available.
Emission Process ID	Unique ID reported consistently over time by State/local/tribal agency.	In some cases, based emission process IDs on permits, test reports, inventories, State correspondence, and NEI. Otherwise, assigned the same ID as the emission unit ID.
Emission Process Description	A text description of the Emission Process.	Described emission processes as "hospital/medical/infectious waste incineration."
Emission Release Pt ID	State/local/tribal ID for point/location where emissions are released to	In some cases, based emission release point IDs on permits, test reports, inventories, State correspondence, and NEI. Otherwise, assigned the same ID as the

Field name	Description	Information sources
	ambient air.	emission unit ID.
Emission Release Pt Description	A text description of the Emission Release Point.	All but two facilities have one stack serving each incinerator. The remaining two facilities have one stack serving two incinerators (although one of the facilities is not currently using the second incinerator). Provided text descriptions based on these configurations.
SCC	EPA Source Category Code for Point Sources.	Taken from NIF SCC code table. Assigned SCC code of “50200501” to those commercial/institutional HMIWI operating on a continuous or intermittent basis (most units). Assigned SCC code of “50200502” to the commercial/institutional HMIWI operating on a batch basis (one unit). Assigned SCC code of “50200503” to those commercial/institutional HMIWI which use a rotary kiln incinerator (three units). Assigned SCC code of “50100505” to locally-operated HMIWI (two units at one facility).
Control System Description	Description of control equipment chain.	Most control devices based on information from permits and test reports, but one based on information from website.
Control System Abbr	Abbreviation of control equipment used (FF=fabric filter, DIFF=dry injection fabric filter, WS=wet scrubber, CC=combustion control, ESP=electrostatic precipitator, WESP=wet ESP, CA=carbon adsorber).	Based on control system description.
Waste Types	Types of waste incinerated at the facility.	Based on waste type information from test reports.
Design Capacity (lb/hr)	Numeric value of average operational capacity (in lb/hr) for an emission unit	Based on design capacity information from permits, test reports, and inventories.
Design Capacity Notes	Notes regarding calculation of design capacity.	Documented inputs used to calculate design capacity.
Design Capacity Batch (lb/batch)	Numeric value of average operational capacity (in lb/batch) for a batch emission unit.	Based on batch design capacity information from test reports.
Max Charge Rate (lb/hr)	Numeric value of maximum charge rate (in lb/hr) for an emission unit if different from design capacity.	Based on maximum charge rate information from permits, test reports, inventories, and facility contacts. Several facilities chose to have their permits revised to reduce their allowable HMIWI charge rates below design capacity in order to qualify for a smaller HMIWI size category with less stringent emission limits.

Field name	Description	Information sources
Max Charge Rate Notes	Notes regarding calculation of maximum charge rate.	Documented inputs used to calculate maximum charge rate.
Avg Throughput (lb/hr)	Average numeric value of throughput over entire emission test.	Based on average of test throughput data from test reports.
Annual Throughput for 2002 (tpy)	Numeric value of 2002 annual throughput (in tpy)	Most based on 2002 annual throughput values from facilities, EPA Regions, and States. Data not available for several units, so annual throughput values were calculated using hourly throughputs from stack test and annual operating hours from facilities.
Annual Throughput for 2002 Notes	Notes regarding calculation of 2002 annual throughput.	Documented inputs used to calculate annual throughput.
Est. Annual Throughput	Numeric value of estimated annual throughput (in tpy)	Calculated based on maximum charge rate and annual operating hours, assuming the unit operates at 2/3 capacity.
Est. Annual Throughput Notes	Notes regarding calculation of estimated annual throughput (in tpy)	Documented method used to calculate estimated annual throughput
Winter Throughput PCT	The percentage a process operates during the winter months. Whole number between 0 and 100.	Taken from NEI and EPA's Envirofacts website. Otherwise assumed "25 percent" for each season.
Spring Throughput PCT	The percentage a process operates during the spring months. Whole number between 0 and 100.	Taken from NEI and EPA's Envirofacts website. Otherwise assumed "25 percent" for each season.
Summer Throughput PCT	The percentage a process operates during the summer months. Whole number between 0 and 100.	Taken from NEI and EPA's Envirofacts website. Otherwise assumed "25 percent" for each season.
Fall Throughput PCT	The percentage a process operates during the fall months. Whole number between 0 and 100.	Taken from NEI and EPA's Envirofacts website. Otherwise assumed "25 percent" for each season.
Annual Avg Hours Per Day	Average number of hours per day an emission process is active within year.	Most based on data from facilities, EPA Regions, and States, with a few based on data from NEI and one based on data from a permit.
Annual Avg Hours Per Day Notes	Notes regarding calculation of annual average hours per day.	Documented inputs used to calculate annual average hours per day.

Field name	Description	Information sources
Annual Avg Days Per Week	Average number of days per week an emission process is active within year.	Most based on data from facilities, EPA Regions, and States, with four based on data from NEI and two based on data from a permit.
Annual Avg Days Per Week Notes	Notes regarding calculation of annual average days per week.	Documented inputs used to calculate annual average days per week.
Annual Avg Weeks Per Year	Average number of weeks per year an emission process is active.	Most based on data from facilities, EPA Regions, and States, with four based on data from NEI and two based on data from a permit.
Annual Avg Weeks Per Year Notes	Notes regarding calculation of annual average weeks per year.	Documented inputs used to calculate annual average weeks per year.
Annual Avg Hours Per Year	Average number of hours per year an emission process is active.	Most based on data from facilities, EPA Regions, and States, with four based on data from NEI and two based on data from a permit.
Annual Avg Hours Per Year Notes	Notes regarding calculation of annual average hours per year.	Documented inputs used to calculate annual average hours per year
Stack Height (ft)	The height (in feet) of a stack.	Most based on stack height data from test reports. Several based on stack height data from permits, EPA's Envirofacts website, and NEI.
Stack Diameter (ft)	The diameter (in feet) of a circular stack.	Based on stack diameter data from test reports. Stack diameter values also could be calculated based on data for stack area, or data for exit gas flow rate and exit gas velocity.
Stack Dimensions (ft x ft)	The dimensions (in feet x feet) of a non-circular stack.	One unit has rectangular, not circular, stack. Therefore, stack diameter is not relevant for this units. Provided stack dimensions in units of feet x feet.
Stack Area (ft <sup>2</sup> )	The area (in square feet) of a stack.	Based on stack area data from test reports. Stack area values also could be calculated based on data for stack diameter, or data for exit gas flow rate and exit gas velocity.
Exit Gas Temperature (deg F)	The temperature of an exit gas stream (degrees Fahrenheit).	Based on average stack temperatures from test reports.
Exit Gas Velocity (ft/s)	The velocity of an exit gas stream (feet per second).	Based on average exit gas velocities from test reports. Exit gas velocities also could be calculated based on data for exit gas flow rate and stack diameter.
Exit Gas Flow Rate (acfm)	Numeric value of stack gas flow rate in actual cubic feet per minute.	Based on average actual gas flow rates from test reports.
Exit Gas Flow Rate Std	Numeric value of stack gas flow rate in dry	Based on average standard gas flow rates from test



Field name	Description	Information sources
(dscfm)	standard cubic feet per minute.	reports.
HCl Unit Average Concentration (ppmvd)	Numeric value of average HCl concentration (in ppmvd) for an emission unit	Based on average HCl concentration data from test reports.
CO Unit Average Concentration (ppmvd)	Numeric value of average CO concentration (in ppmvd) for an emission unit	Based on average CO concentration data from test reports.
Pb Unit Average Concentration (mg/dscm)	Numeric value of average Pb concentration (in mg/dscm) for an emission unit	Based on average Pb concentration data from test reports.
Cd Unit Average Concentration (mg/dscm)	Numeric value of average Cd concentration (in mg/dscm) for an emission unit	Based on average Cd concentration data from test reports.
Hg Unit Average Concentration (mg/dscm)	Numeric value of average Hg concentration (in mg/dscm) for an emission unit	Based on average Hg concentration data from test reports.
PM Unit Average Concentration (gr/dscf)	Numeric value of average PM concentration (in gr/dscf) for an emission unit	Based on average PM concentration data from test reports.
Total CDD/CDF Unit Average Concentration (ng/dscm)	Numeric value of average CDD/CDF concentration (in ng/dscm) for an emission unit	Based on average CDD/CDF concentration data from test reports.
CDD/CDF TEQ Unit Average Concentration (ng/dscm)	Numeric value of average TEQ concentration (in ng/dscm) for an emission unit	Based on average TEQ concentration data from test reports.
NO <sub>x</sub> Unit Average Concentration (ppmvd)	Numeric value of average NO <sub>x</sub> concentration (in ppmvd) for an emission unit	Based on average NO <sub>x</sub> concentration data from test reports.
SO <sub>2</sub> Unit Average Concentration (ppmvd)	Numeric value of average SO <sub>2</sub> concentration (in ppmvd) for an emission unit	Based on average SO <sub>2</sub> concentration data from test reports.
HCl Annual Emissions (lb/yr)	Numeric value of annual HCl emissions (in lb/yr) for an emission unit	Based on emissions and parameter data from test reports and annual operating hours.

Field name	Description	Information sources
CO Annual Emissions (lb/yr)	Numeric value of annual CO emissions (in lb/yr) for an emission unit	Based on emissions and parameter data from test reports and annual operating hours.
Pb Annual Emissions (lb/yr)	Numeric value of annual Pb emissions (in lb/yr) for an emission unit	Based on emissions and parameter data from test reports and annual operating hours.
Cd Annual Emissions (lb/yr)	Numeric value of annual Cd emissions (in lb/yr) for an emission unit	Based on emissions and parameter data from test reports and annual operating hours.
Hg Annual Emissions (lb/yr)	Numeric value of annual Hg emissions (in lb/yr) for an emission unit	Based on emissions and parameter data from test reports and annual operating hours.
PM Annual Emissions (lb/yr)	Numeric value of annual PM emissions (in lb/yr) for an emission unit	Based on emissions and parameter data from test reports and annual operating hours.
Total CDD/CDF Annual Emissions (g/yr)	Numeric value of annual CDD/CDF emissions (in g/yr) for an emission unit	Based on emissions and parameter data from test reports and annual operating hours.
CDD/CDF TEQ Annual Emissions (g/yr)	Numeric value of annual TEQ emissions (in g/yr) for an emission unit	Based on emissions and parameter data from test reports and annual operating hours.
NO <sub>x</sub> Annual Emissions (lb/yr)	Numeric value of annual NO <sub>x</sub> emissions (in lb/yr) for an emission unit	Based on emissions and parameter data from test reports and annual operating hours.
SO <sub>2</sub> Annual Emissions (lb/yr)	Numeric value of annual SO <sub>2</sub> emissions (in lb/yr) for an emission unit	Based on emissions and parameter data from test reports and annual operating hours.

**Appendix A**  
**HMIWI Source and Emissions Inventory**

**Appendix B**  
**Acronyms and Abbreviations Used in HMIWI Source and Emissions Inventory**